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# Learning through computer games

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***Abstract*** *– In this text we will talk about modern computer technology and its influence on children education. The computer technology is entering many spheres of human activities and is changing the life style of the modern man. It influences the educational process by changing the way of learning. How that works we can see and understand if we direct learners' attention through computer games.*

*Computer games are wildly popular with young people. They show new ways of learning typical for the new informatics age, help people learn by integrating knowledge and enable learners to deal with things that are important to them.*

*However, computer games can be used in anti-social and destructive ways, based on—violent and sometimes misogynistic themes. But even the strongest critics agree that we learn something from playing video games. The question is: how can we use the power of video games as a constructive force in schools, homes, and at work?*

***Key words:*** *computer games, learning, changing.*

The contemporary man today lives in a period of fast development of computer technology. Computer technology invades every aspect of human living by changing the world. Everything is changing: the way of work, the way of do the shopping, the manners of entertainment, the way we communicate, the way we establish emotional relationship with another people, etc. This imposes a question: Do computers also change the way we learn? The best way to see how this happens is to focus on the computer games.

There are a number of reasons why that are necessary. Firstly, the computer games demonstrate how we can create new and powerful manners to learn in the schools, the community and the work place, i.e. they represent new ways of

learning that characterize the new Age of Informatics. Secondly, they are especially popular with young population, for them computer games are more than just a simple game. Thirdly, they create new socio-cultural worlds, worlds where people can learn by integrating knowledge, social interaction and technology and enable them to be engaged in things that are of great value for them.

The computer games, just as the books and television can be used in an anti-social and destructive ways. Games essentially simplify reality, but the modern games often include or are based on violence and themes filled with hatred through humanity. Critics consider that lessons people learn playing games, which exist at the moment, are not welcomed every time. But, even the strictest critics agree that sometimes people learn from computer games. This imposes the essential question: How can we use the power of computer games as a constructive power in the school, home and work? A learning environment needs to be created based on the educational characteristic of games, regarding the learning theories appropriate for the era of the new and powerful technology.

Schools instead of closing their doors on video and computer games they prefer to intensify the question of influence this type of games have and whether they could provide a new powerful source to obtain knowledge from different spheres.

The brightness point concerning the question whether there is an actual need for this type of games in education, are the facts in the process of playing video and computer games there is: fun present in the learning process which provides with an increased interest and satisfaction while learning, practice learning (games today are characterized with a large degree of reality), learning in cooperation, a possibility to perform imaginative experiments which improves pupils' ability to "learn how to learn", a possibility to create and connect to the terms being taught (as oppose to memorizing "naked" facts), brain engagement to absorb complex themes and problems, an opportunity for pupils to learn practical skills which can be used in real life.

All of this represents a challenge placed in front of the educational process, and at the same time having many obstacles on its achievement, which is reason enough for the implementation of video and computer games in education and education institutions.

Therefore, the need of having better understanding for the usage of computer games in the educational process is absolutely justified, having their researchers and their designers directed towards creating computer games which will have the principles of learning as a base, wherewith real educational games will be created which will have powerful and positive impact on the young population.

There are many reasons why users play computer games. One of the very first and most exciting research is Malone's (1981) research, where he defines three basics reason: fantasy, challenge and curiosity (Asgari and Kaufman, 2004).

Curiosity is a result of the existence of a gap in knowledge. It can be stimulated in a way that individuals will have a feeling that their existing knowledge lacks one or more of these characteristics: completeness, consistence and economy. In games, mysteries can provoke curiosity. For example: adventures themes, also including the activities in a context of fantasy can stimulate curiosity.

Malone and Leper (1987) define fantasy as an environment which causes mental images of physical or social situations that are not present at the moment (Asgari and Kaufman, 2004). Through fantasy individuals can participate in situations that are not part of their real life. A fantasy environment can increase the internal motivation of the individual while satisfying their needs. Likewise, Gee (2003) claim that in computer games, some players are playing out of their 'real' identity (Asgari and Kaufman, 2004). For example, they can play out with their virtual characters as someone who takes risks, someone who is creative or someone who successful deals before failure. But in the real life, that person might not be anything alike. According to Mayers (1990) a fantasy, as oppose to challenge an interaction, is not strong enough to motivate and activate the individual, but it has the influence to engage the player in the first phase of playing a game, when the player decides whether to start playing the game or not (Asgari and Kaufman, 2004).

Malone (1980) claims that the characteristics which make a game entertaining does not necessarily make them educational too (Asgari and Kaufman, 2004).This presents the question: does adding an entertaining characteristic to the games which appear to increase motivation and interests of pupils also bring to a more successful learning. Lepper and Malone (1987) discuss the effects of adding characteristics of games in the educational contents for the motivation and learning of students (Asgari and Kaufman, 2004). Concerning the learning process, they analysed two approaches. From one perspective, they claim that this attribute can be confusing and decrease learning process. From the other perspective, these games can increase the attention of the pupil and finally improve the learning process.

When it comes to motivation, they claim that adding games can increase pupils' motivation for a short period. However, on longer bases, it can have negative consequences, because when students return to the regular school work, they find the material boring, so their interests can decrease. From another perspective, they claim that these motivating characteristics can have positive effects.

Another empirical research from Chen and coop. (1998) demonstrates the positive effects from teaching based on computer games concerning the motivation and learning (Asgari and Kaufman, 2004). Cordova (1993) claims that securing the teaching process based on computer games enables improvement of the learning process, because it increases the entertainment, attention, effort and concentration of the pupils (Asgari and Kaufman, 2004).

It's necessary to include computer games in the educational process because they provide: individualization, simulation and complexity of the learning process.

**Individualization of learning:** the Artificial Intelligence in computer games enables the learning experience while playing a computer game to be different for different player. In other words the computer game played by one individual is different from the same game played by other individual because both individuals have different skills and knowledge and make different choices while playing the game.

Video games are adoptable in level of difficulty and can be customized according to the player's level of skills providing unique experience that is also challenging for every individual in a way that the game participants are constantly challenged by receiving feedback or a score so they try again and again until they begin to show progress. The challenges are not too difficult so that the participants of the game might think that they are unbeatable and would loose the interest. Computer games are made to enable their players to act far beyond their level of competence. The fact that playing computer games can lead to improved skills and knowledge is a strong argument in favor of the use of computer games in education.

This concept is called *Zone of Proximal Development* and it was issued and developed by the soviet psychologist Lev Semyonovich Vygotsky– zone in which children can master range of tasks that are very difficult for their age**.**

Learning through computer games is very similar to the learning with the help of a teacher because the learning process is guided and assisted by *someone more skilled* which helps in increasing the skill and knowledge level of the student. For measuring a student's current skill level and future growth is used a systematic method called rating scales. The primary purpose of the rating scales is to help educators define a child's current skill level and to monitor the child's progress through individual "just in time" assistance.

One of the reasons why computer games are so attractive is that the players are constantly faced with new challenges that aren't too easy or too hard; this motivates the children to go on with the game because they can always presume the next step.

**Simulation of authentic experience*:*** games always situate the meanings of words in terms of the actions, images, and dialogues they relate to, and show how they vary across different actions, images and dialogues. Recent researches suggest that people only really know what words mean and learn new ones when they can hook them to the sorts of experiences they refer to, to the sorts of actions, images, or dialogues the words relate to.

Computer game design industry is getting better every day in creating reality simulations using sounds, images, actions, videos. Many corporations

use the simulation programs to train their stuff. It is used by the government, for military planning, military training ect.

With the development of the computer simulations when used in the distant education more objective data will be provided. We will be able to watch complex, realistic stimulation of historical events, ancient civilizations, scientific and mathematical processes.

**Intellectual complexity:** One of the reasons why some teachers think that computer games should be part of educational programs is that they seem to have a way of engaging and interesting young people. They are fun and incorporate good learning principles, but it should also be mentioned that computer games are hard and complex.

A video game is a set of rules as well a fictional world, filed with details and different difficulty levels.

Computer games are very different from the game we used to play such as: monopoly, chess, puzzles. These games don't have different difficulty levels and by playing them we don't have to interact with a set of rules. We are used to playing these games and that is why computer games seem confusing. We still think that all we have to do is push the buttons faster. The players are left free to roam in a complex problem space and they should hit on creative solutions to complex problems. The problems that players face are ordered so that the earlier ones are well built to lead players to form hypotheses that work for harder problems. By playing these games a player should deal with lot of confusing information and decisions and sometimes are needed even more then 40 hours.

Good games offer players a set of challenging problems and then let them solve these problems until they have virtually routinized or automatized their solutions. Then the game throws a new class of problem at the players so he needs to think of how each action taken might impact on their future actions.

Playing computer games in educational practice provides benefits in the following areas:

**Cognitive Abilities**: By playing computer games one can gain new knowledge; construct and reconstruct conceptual schema; improving one's logical, analytical, critical and creative thinking; it can improve short-term memory**,** long-term memory, system thinking; it can help in recognizing problems and dealing with them; principal decision-making; including the use of metacognitation to understand the perspectives that create the complexity in concepts, and the use of mental models; strategies of improving the way we are thinking and perceiving

**Psycho-motorical abilities and skills**: Although there are different kinds of rules in video games, one can still manipulate with objects which helps the process of skills development. The more complex video games such as driving or

flying simulations can be used to learn and develop psycho– motorical abilities and skills. Playing computer games can also lead to improvement of the psycho–motorical abilities and development of analytical and spatial abilities, selective visual attention and computer skills ect.

Game simulations can be used to prepare a person for real situations such as preparing the students for for the world of work; they can also be used in the business sphere to study the decision making elements of the administrative process.

**Attitudes and values:** by playing computer games children gain new experiences which lead to change of the existing attitudes and values or gaining new ones. One can also develop new skills such as self-control which is an important skill for all children to learn; self control can be practiced trough social simulation and life simulation games which try to simulate realistic social interaction– they show a stressful situation that happen in different professions.

**Getting and gaining knowledge:** while playing computer games the player is doing a "research", gaining new knowledge or reorganizing the existing, getting new ideas, so we can say that in a video game *transfer of knowledge* takes place**.** The fact that the game reacts back giving the player feedback is what makes the player act and make decisions; thereby they are encouraged to take risks and explore. Many people believe that computer games encourage fundamental learning and the fitness of learning; it is also proved that they increase children's self-confidence and self-esteem as they master games.

Using video games in the pedagogical praxis and military training has shown that they can shorten the time of the training and lessen the effort of the trainer/educator in ways that learners are practicing alone with the help of the computer game. But not every computer game ends up with gained knowledge because some games can be very confusing and can have more than one aim.

**Interaction:** the computer games can grow up a sense of understanding emotions of others, perceiving differentiating behaviors and develop an ability to influence other people's emotions and behaviors which can be used in many professions especially in sale, management ect. These skills improve a child's social experience with other children; they can also improve people's social networks and enabling greater social participation and cohesion that also improves the quality of life.

## Conclusion

So instead of criticizing the use of computer games in education and try to ban them we should use the positive side of it.

Learning through computer games is individual; a child gain or develop skills and knowledge, but the most important fact is that learning through computer game is also fun and this motivates the child to learn. But this does not mean that video games should replace traditional classroom teaching. The role of the teacher as a mediator between the child and the game is very important, he should be able to explain the game to the child therefore he must know what the video game consists of and which skills can be developed by playing this game.

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# UČENJE UZ POMOĆ KOMPJUTERSKIH IGARA

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***Sažetak*** *– U ovom radu govorimo o modernoj računalnoj tehnologiji i njezinom utjecaju na edukaciju djece. Računalna tehnologija ulazi u mnoga područja ljudske aktivnosti te mijenja stil života modernoga čovjeka. Ona utječe na edukacijski proces mijenjajući način učenja. Ovo djelovanje možemo vidjeti i razumjeti usmjerimo li pažnju učenika na kompjuterske igre.*

*Kompjuterske igre vrlo su omiljene među mladim ljudima. One pokazuju nove načine učenja tipične za novo informatičko doba, pomažu ljudima u učenju integracijom znanja te pomažu učenicima u savladavanju stvari koje su za njih bitne.*

*Međutim, kompjuterske igre se mogu koristiti na asocijalne i destruktivne načine, u slučaju kad su utemeljene u nasilnim te ponekad i mizogenim temama. No čak se i najljući kritičari slažu u mišljenju da iz igranja video igara ponešto i učimo. Pitanje koje se postavlja je: kako možemo upotrijebiti moć video igara kao konstruktivnu silu u školama, domovima i na poslu?*

***Ključne riječi****: kompjuterske igre, učenje, mijenjanje*